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SWEETCLOVER WEEVIL



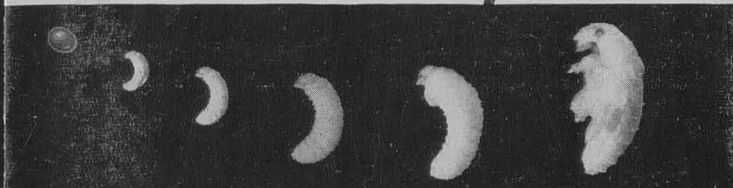
AND

ITS CONTROL

IN MINNESOTA

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Sweetclover Weevil

and Its Control in Minnesota

"What happened to my new seeding of sweetclover?" This is a question often asked by Minnesota farmers.

Studies made by the University during the past two years indicate that sweetclover weevil is a major factor in losses of new seedings. However, it is recognized that the weevil is not the only factor that influences establishment and maintenance of sweetclover stands.

This folder presents results obtained from research on sweetclover weevil during 1952 and 1953 together with general information about the insect.

The Insect

Sweetclover weevil is not a native of Minnesota. It is a European insect first reported in North America in 1924. The weevil is believed to have arrived in Minnesota about 1933 and is now generally distributed throughout the state.

Description

Sweetclover weevil adults are grey or brownish grey insects that are about one-quarter of an inch long. The general appearance of the weevil is shown in figure 1.

The immature weevils appear very different from the adults as may be seen in figure 1. Female weevils lay eggs which are white at first but soon turn shiny black. Small white larvae or grubs hatch from the eggs, develop through four stages, and become pupae. You can find the larvae easily by examining the soil of established stands of sweetclover when the clover is being plowed down.

Newly emerged adults are light tannish brown, and their bodies are much softer than those of older adults.

Life History

Figure 1 shows the stages of development weevils go through and where the development takes place. The figure also indicates, in a broad way, the time of year when the various stages are present. However, the rate of development varies with different conditions, such as moisture and temperature. Preliminary

Seasonal Cycle of Sweetclover Weevil

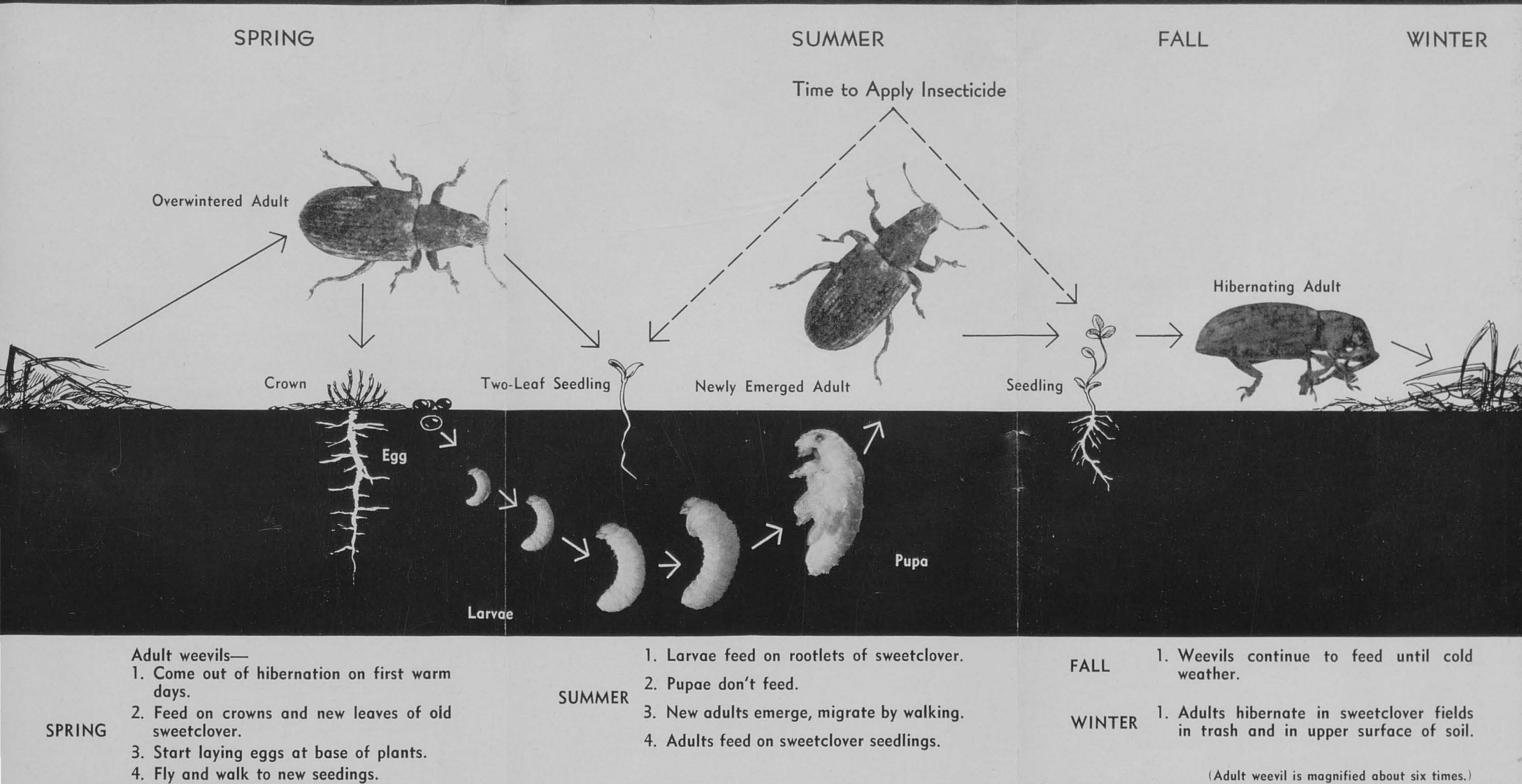


Fig. 1. Development of the sweetclover weevil through the four seasons. Note the two critical times for controlling the weevil.

studies have shown that although the majority of the weevils develop as indicated in the figure, there is some overlapping so that certain stages of immature weevils have been found at nearly all times of the year.

Seasonal History

The seasonal activities of the weevils are also indicated in figure 1. Weevil adults overwinter in trash and surface soil of sweetclover fields.

The overwintered adults become active the first warm days of spring. They feed, mate, and lay eggs. Most of these weevils die later in the summer.

The new adults that emerge in midsummer or a little later feed on sweetclover (and sometimes on alfalfa) until winter.

If there are alternating periods of cold and warm weather in the fall, these adults continue to appear and feed during warm days. They hibernate in trash and surface soil during the winter.

This publication has resulted from a research program on seed production of forage legumes being conducted by the University of Minnesota Agricultural Experiment Station with the assistance of the Iron Range Resources and Rehabilitation Commission.

Facilities for the field work on sweetclover weevil have been provided by the Northwest School and Experiment Station and farmers at Crookston.

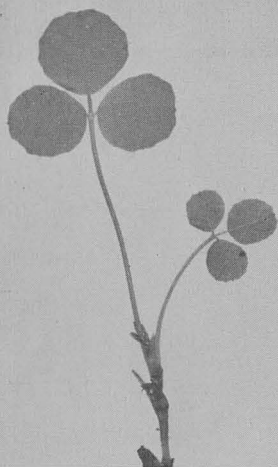


Fig. 2. Right—Crown of sweetclover plant injured by weevils. Left—Healthy plant.

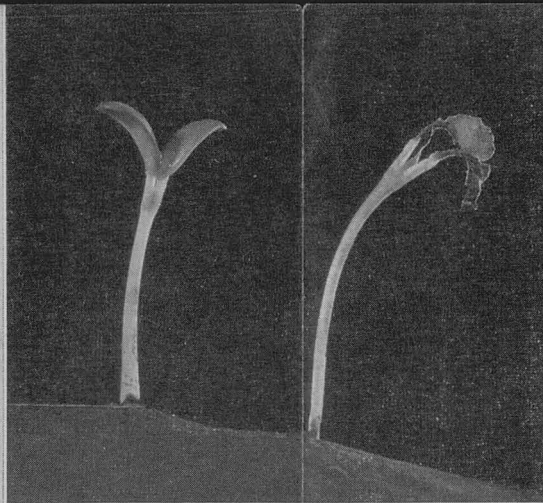


Fig. 3. Right—Two-leaf seedling injured by weevils. Left—Healthy two-leaf seedling.

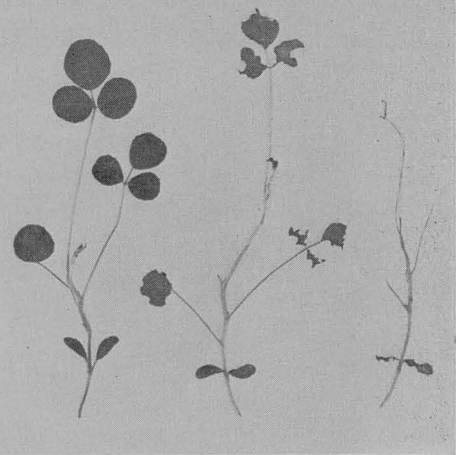


Fig. 4. Weevils also injure (center) and destroy (right) seedlings several inches tall.

How to Recognize Injury

The picture on the cover of a weevil feeding on a mature clover leaf shows the typical notches made by the weevil adult.

Recognition of weevil injury is important since it is easier to find the injury than the weevils. Injury is useful in determining if weevils are present, and whether or not insecticide should be applied.

—To Crowns

"My last year's seeding of sweetclover seems to be standing still this spring," say many Minnesota farmers, and they're right.

Overwintered adults eat the tips off new shoots as soon as the shoots grow (see figure 2). The sides of tender stems below the soil surface may also be injured.

—To New Seedlings

A few notches on a new seedling such as that seen in figure 3 may easily kill the plant.

Weevils migrate from stands where they have hibernated and may be present to attack these new seedlings as soon as the plants emerge. Many losses of stand thought to be due to poor germination were probably caused by weevil.

Learn to recognize the two-leaf seedling and the weevil injury to it (see figure 3). If you find damage, use insecticide to protect these seedlings.

—To Seedlings Several Inches Tall

Seedlings that escaped destruction by weevils in early spring may have to run the gauntlet again in midsummer.

While larger seedlings can sustain considerable injury and survive, plants that are injured as severely

as the one shown on the right in figure 4 often die. Seedlings must be protected at this stage of development if large numbers of newly emerged adult weevils are present.

Large areas of irregular stand can often be seen along the borders of fields where weevils have destroyed new seedlings as these insects moved into a field.

Seed Not Injured

Sweetclover weevils do not injure seed but seed production is not possible if stands are destroyed.

Sweetclover Weevils Sometimes Injure Alfalfa

Sweetclover weevil, as the name implies, is usually associated with injury on sweetclover, but the weevil is known to injure alfalfa (see figure 5).

Watch for weevil injury to alfalfa seedlings and apply the same chemical controls recommended for sweetclover.

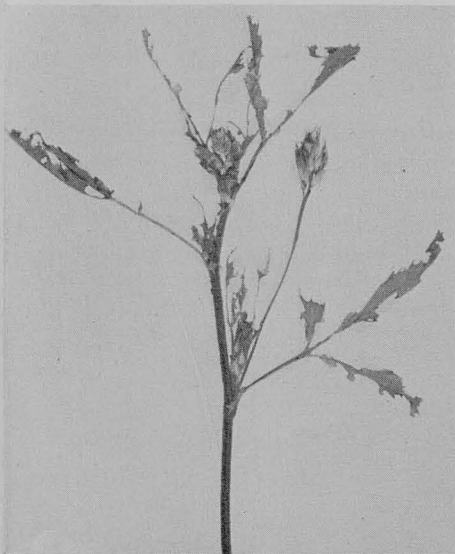


Fig. 5. Alfalfa plant from a field severely injured by sweetclover weevil. This field was near sweetclover which had been plowed down for green manure. Weevils can completely destroy new seedlings of alfalfa.

Control Sweetclover Weevil

What to Use

On the basis of tests made in 1953 the following insecticides are recommended for control of sweetclover weevil (amounts given in pounds of active ingredient required per acre):

1. **Heptachlor** ½ pound
2. **Dieldrin** ½ pound
3. **Aldrin** ½ to ¾ pound
4. **Toxaphene** 2 to 3 pounds
5. **Chlordane** 2 to 3 pounds

Present evidence indicates that heptachlor and dieldrin give better protection against weevil injury than the other materials compared. DDT applied at 2 pounds per acre was less effective; at least 3 pounds are needed.

Sprays are satisfactory and dusts appear to be. Sprays can be applied by plane or ground equipment.

When to Apply Insecticides

Data obtained have indicated that there are two critical times for protecting new seedings:

1. **Early in spring when overwintered adults migrate from old stands onto new seedings, and**
2. **In midsummer when new weevil adults emerge from old stands.**

Where to Apply Insecticide

It is advisable to spray the entire field of new seedings in the spring since overwintered adults migrate by flying and walking.

However, new adult weevils that emerge in midsummer are soft and do not fly when they first come out. Many of them can be killed by spraying the borders of fields from which they emerge or those of new seedings which they may be invading.

Avoid Planting Next to Established Stand

It's a good idea not to plant a new seeding of sweetclover close to an old stand if you can avoid it. Both overwintered and newly emerged adult weevils migrate from old stands to new seedings.

Other Possibilities for Controlling Weevils

Chemical control of the weevil has been emphasized here, but biological control, cultural control, and resistance of sweetclover varieties to weevil injury are being investigated.

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